

ECS Talk: Digital Memory Manager: Database and Filesystem Directions

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Business Platforms**

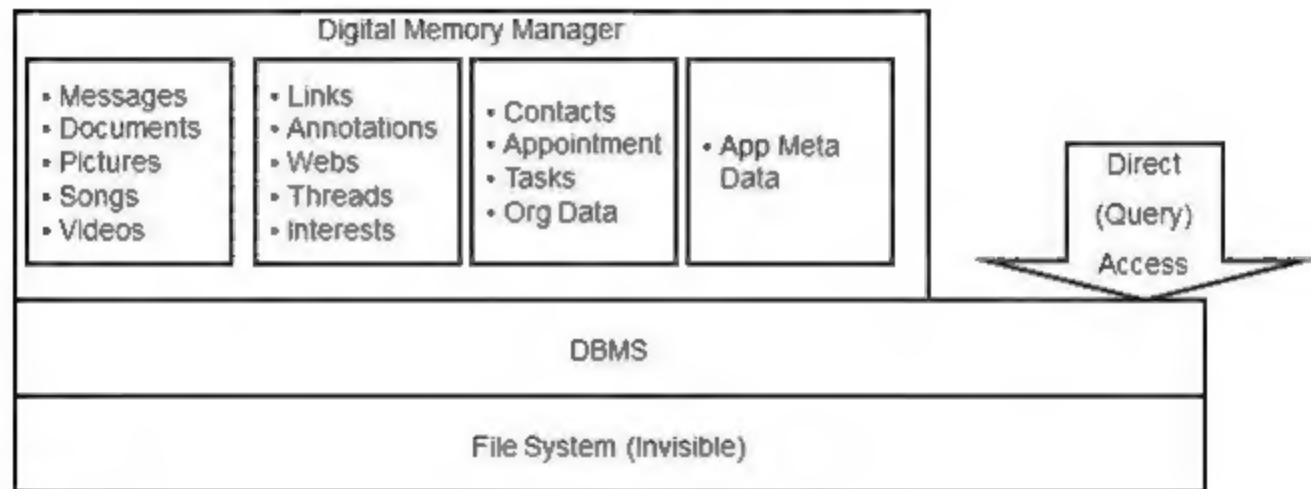
The Digital Memory Manager
Reality & Dreams

The Digital Memory Manager

Pragmatism and Dreams

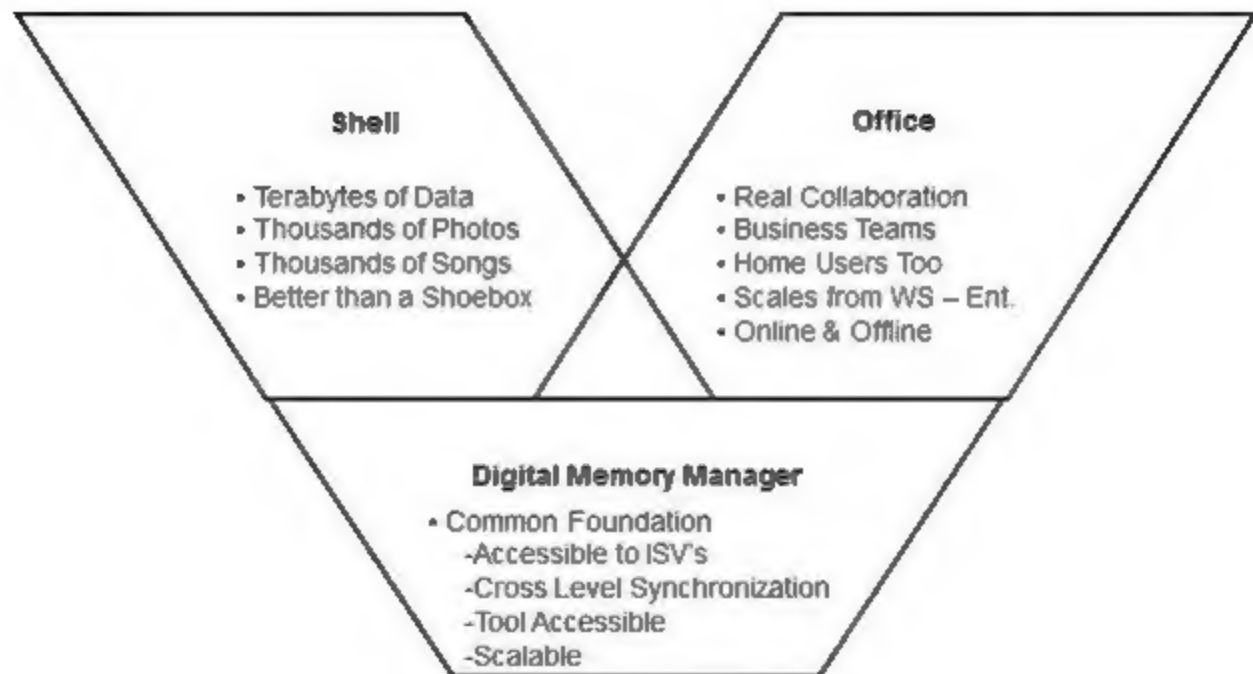
A Plan for The Store We Really
Need

The Digital Memory Manager: More Than A Layer



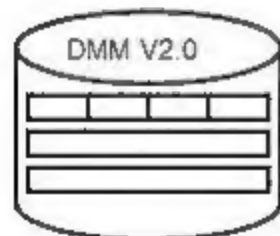
- Yes, A Store
- No, Not a Database
 - Uses Database Directly and Naturally
 - Heavily Schema Based

Why Would Anybody Want It?



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Reality & Dreams

Walk, Then Run . . .



Longhorn	BlackComb
<ul style="list-style-type: none">• Special "App" Level Store<ul style="list-style-type: none">- New API's Only- Stores Collections & People- Exists only as an app "layer"- Used by Shell & Office• STS facilities (Threads, etc)• Primarily People	<ul style="list-style-type: none">• Full File System Replacement<ul style="list-style-type: none">- Complete W32FSAPI- Store Exes- Kernel Mode Enhancements- Used by All Apps• Rich Collaboration• Complete People, Places, Time• Registry Replacement• Application Meta Data Storage• Versioning and Branching• New Formats for Sound, Pics• New Indexing (Faces, etc)• Rich DRM, Distribution Engine

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Why Have We Failed?

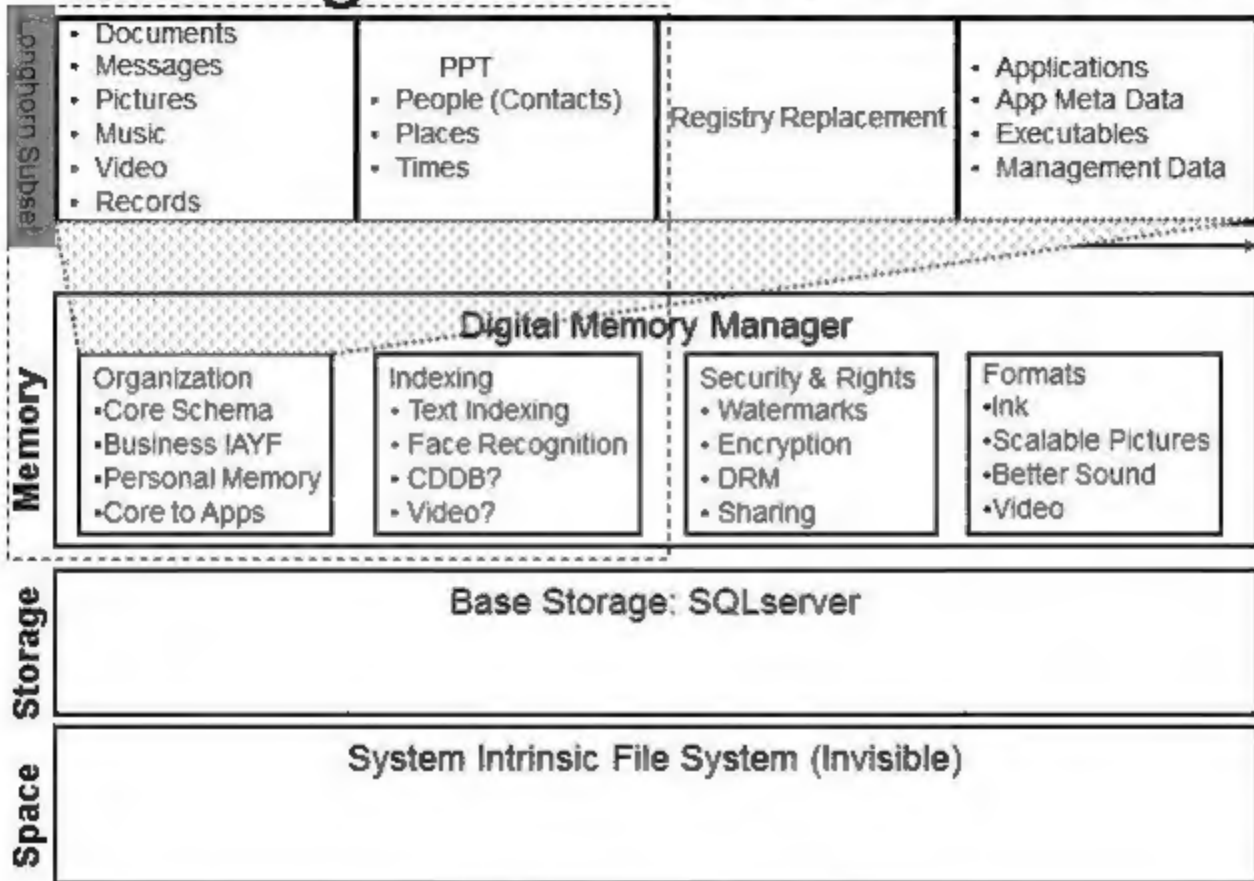
And Can We Succeed Now?

- Unwillingness to make hard decisions
- Wrong architecture from the beginning
- Core parts of the design wrong each time
- Unwillingness to make big bets
- Trying to do it all in one step – too big, too long, too hard
- Not recognizing the “build parts before systems” problem
- Only planning one release at a time

But Isn't Another Layer Bad?

- **SQLserver and Exchange are both “layers”**
- **All database servers, all applications servers, all collaboration servers are layers**
- **Successful file systems have been built as layers**
- **All slide managers, asset managers, document managers are layers**
- **Historically network operating systems (NOS's) were basically a form of -- primarily storage – layer**
- **This is a big and important piece, worth being an engine in it's own right**
 - **It is a form of document manager**
 - **Document managers have always been engines (built on db's)**
 - **Eventually it will be the most heavily used store in the world**

Once Again: What Is the DMM?

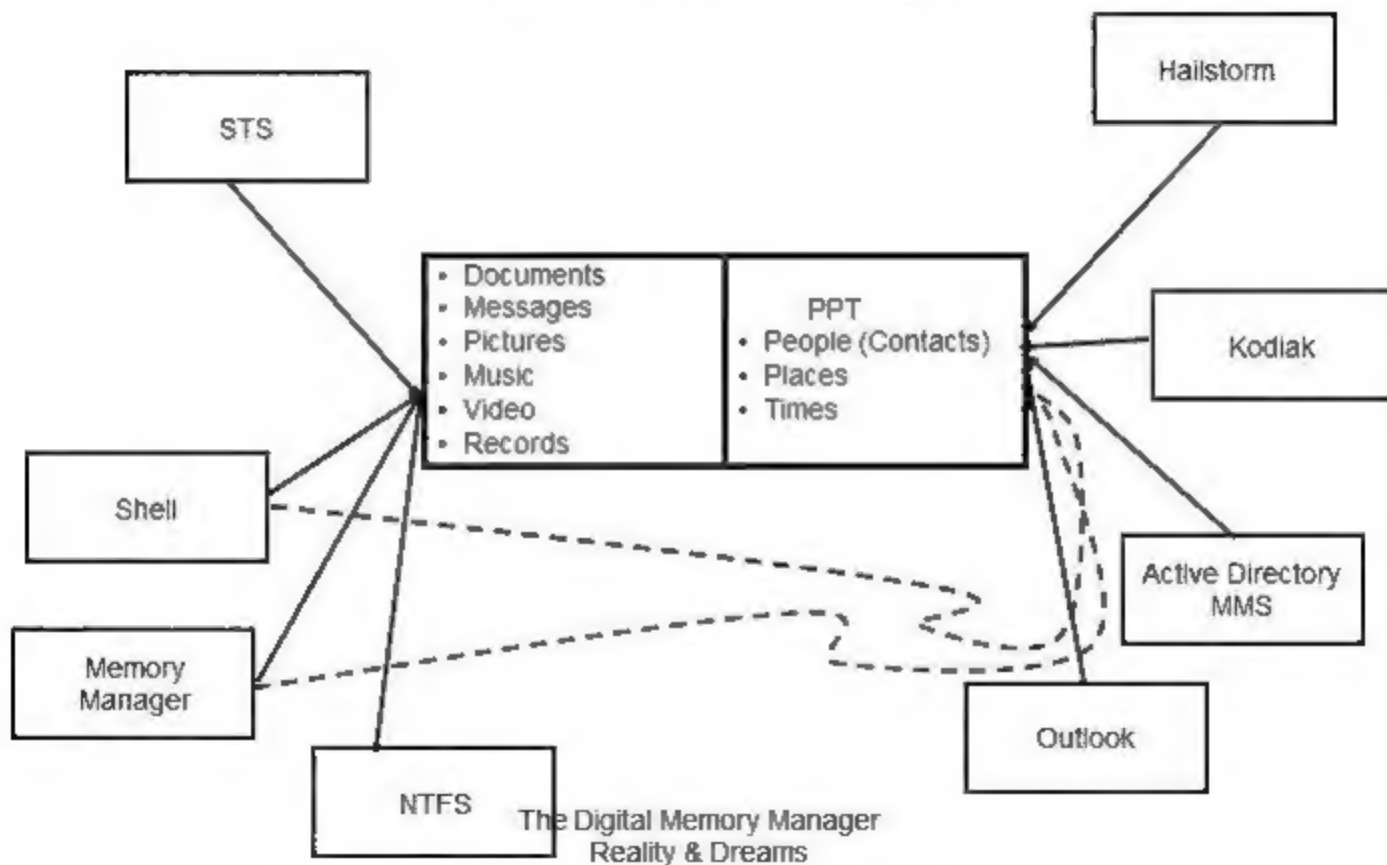


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How Many ****** Do We Need?

	File System	Directory	Calendar	PIM
Hailstorm		Y	Y	
STS	Y		Y	Y
Digital Memory Manager	Y	Y	Y	
Shell		Y ?		Y
Outlook		Y	Y	Y
Kodiak		Y	Y	
AD / MMS		Y		
NTFS	Y			

Pieces and Conflicts: Two Core Areas

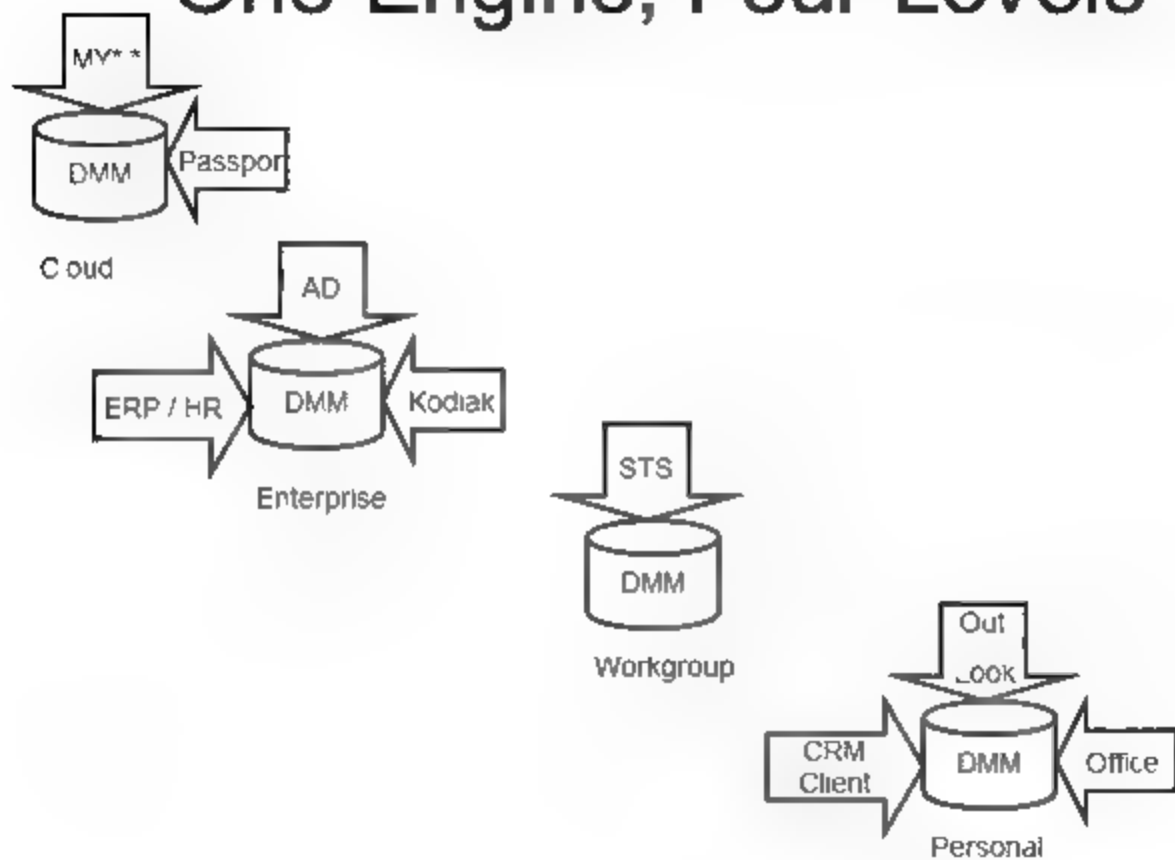


Four Levels (And a Fifth . . .)

Globa (Internet) Isolated Data Model	<ul style="list-style-type: none"> • Internet Scale • Highly Controlled Access • Worldwide Scope 	<ul style="list-style-type: none"> • Simplistic but tight Security • Synchronization • Simple Resource Scheduling 	<ul style="list-style-type: none"> • Very Limited Doc Store • Public Media Distribution Publishing • Royalties and Sales
Enterprise (Intranet) Shared Data Model	<ul style="list-style-type: none"> • Protected Servers • Sophisticated Admin • Domains & Boundaries 	<ul style="list-style-type: none"> • Complex Security • Replication • Resource Coordination 	<ul style="list-style-type: none"> • Document Workflow • Media Libraries • DRM
Workgroup or Family Synchronized Models	<ul style="list-style-type: none"> • Peer to Peer • Self Managing • Shared Contacts 	<ul style="list-style-type: none"> • Simple Security • Synchronization • Schedule Mngmnt 	<ul style="list-style-type: none"> • Shared Documents • Shared Songs • Shared Pictures
Personal (Local) (Desktop Notebook)	<ul style="list-style-type: none"> • Replaces PST • Local Identity Service 	<ul style="list-style-type: none"> • Operate Online • Operate Offline • Automatic Synchronization 	
Appliance	<ul style="list-style-type: none"> • Subset of Personal Level 	<ul style="list-style-type: none"> • Operate Online • Operate Offline • Automatic Synchronization 	

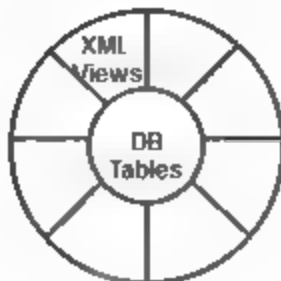
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One Engine, Four Levels

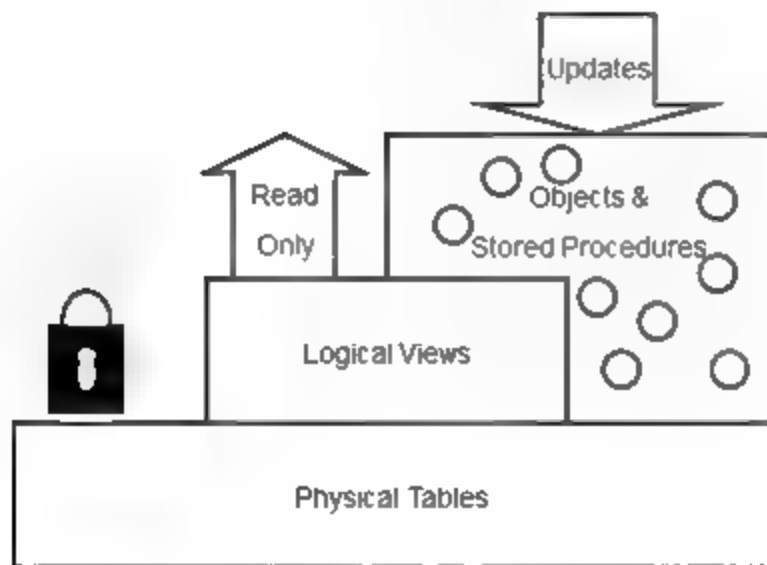


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One Model: Many Faces



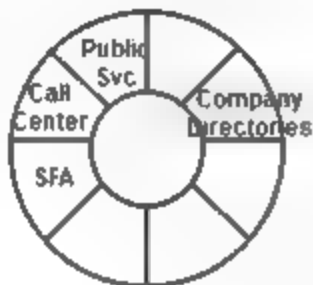
Direct Table Access? Really?



Offline, Online, Shared, Hosted



Cloud



Enterprise



Workgroup

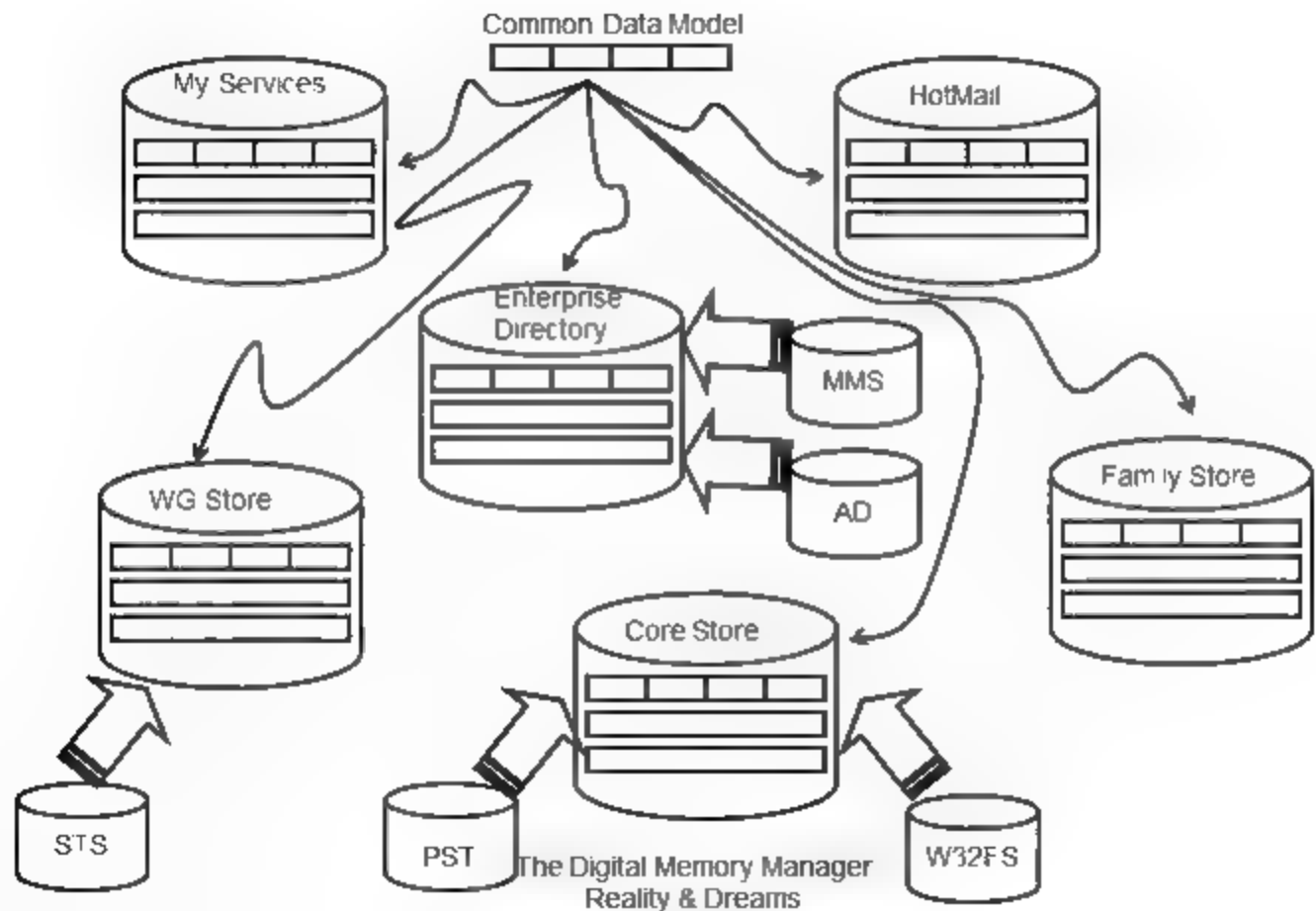


Personal



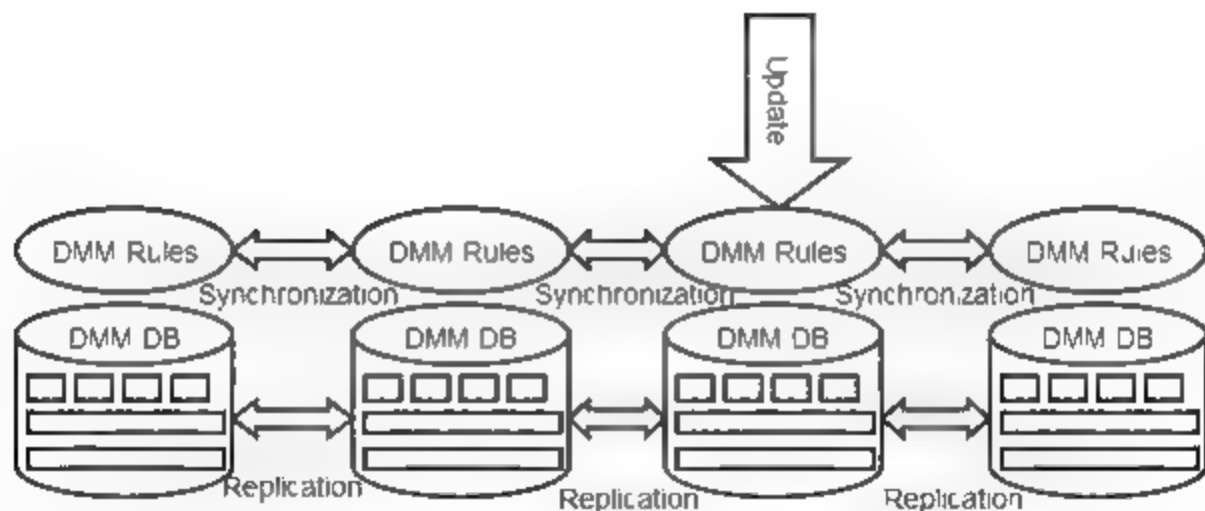
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Common Base Storage & Model



Where Is The Code?

Where Are the (Business) Rules?



Base Storage Architecture

Digital Memory Manager

Organization

- Core Schema
- Business AYF
- Persona Memory
- Core to Apps

Indexing

- Text Indexing
- Face Recognition
- CDDB?
- Video?

Security & Rights

- Watermarks
- Encryption
- DRM
- Sharing

Formats

- Ink
- Scalable Pictures
- Better Sound
- Video
- Documents
- Records

Base Storage: SQLserver

Extended Relational
Algebra

Relational File
System

XML Logical Views

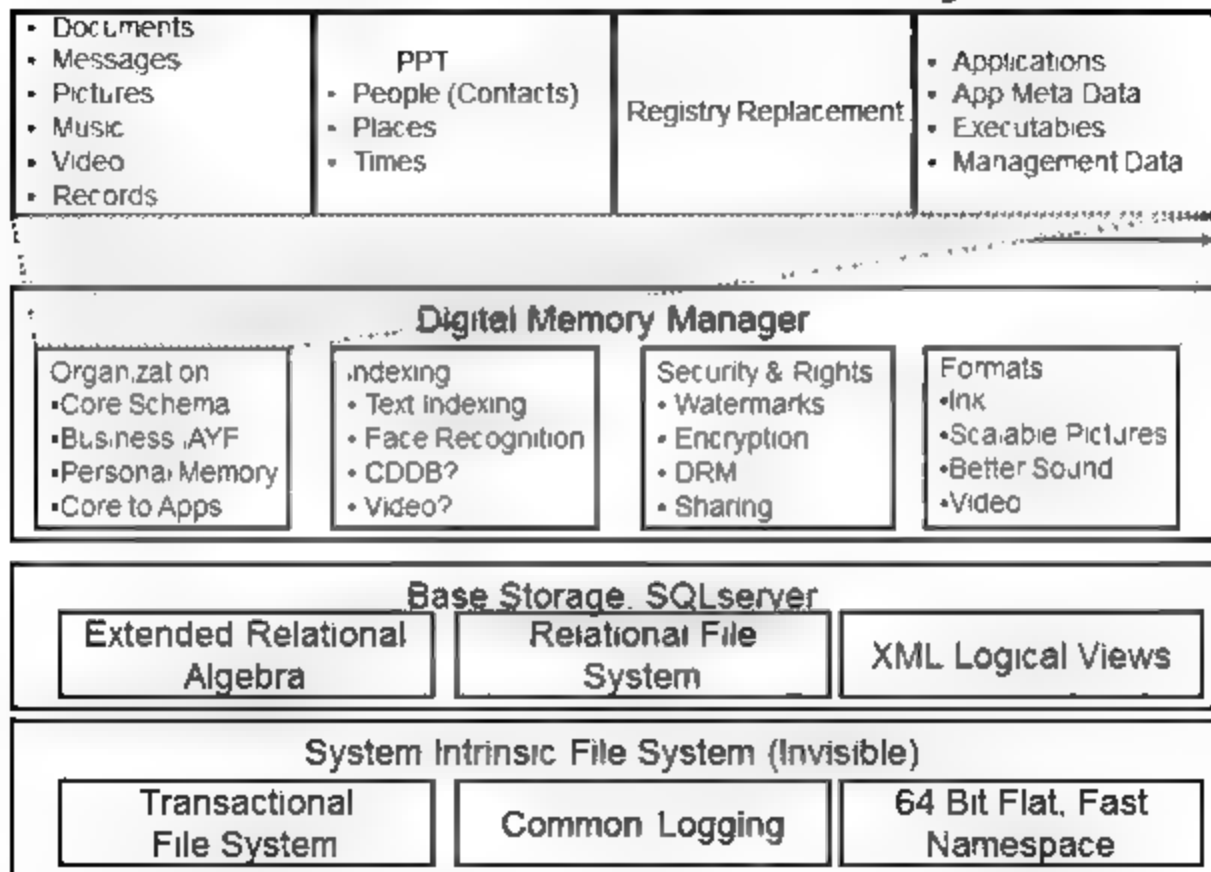
System Intrinsic File System (Invisible)

Transactional
File System

Common Logging

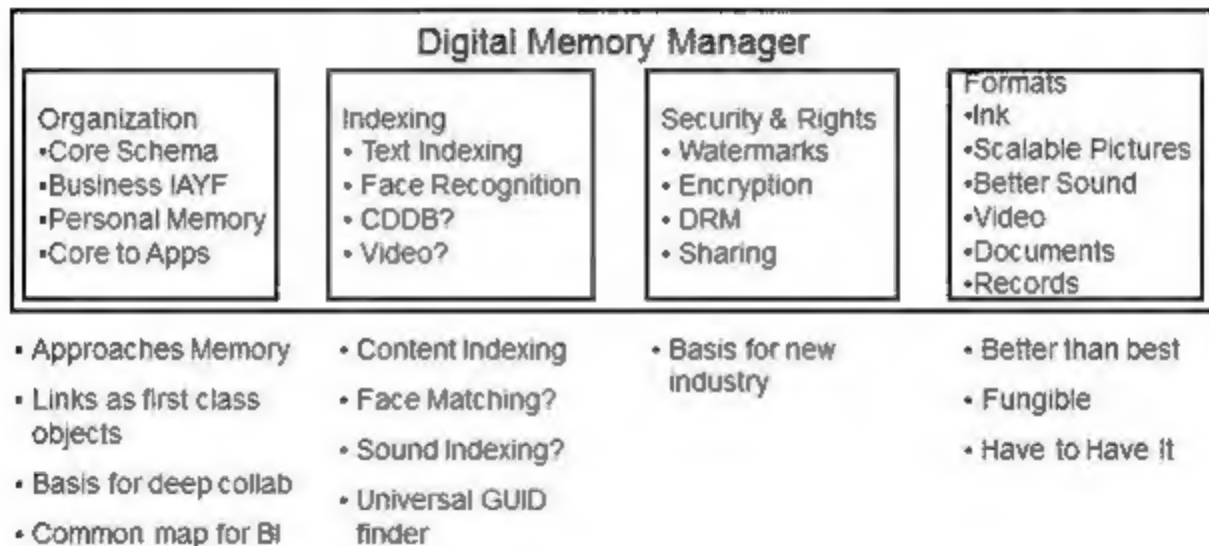
Flat, Fast
Namespace

Schema Taxonomy

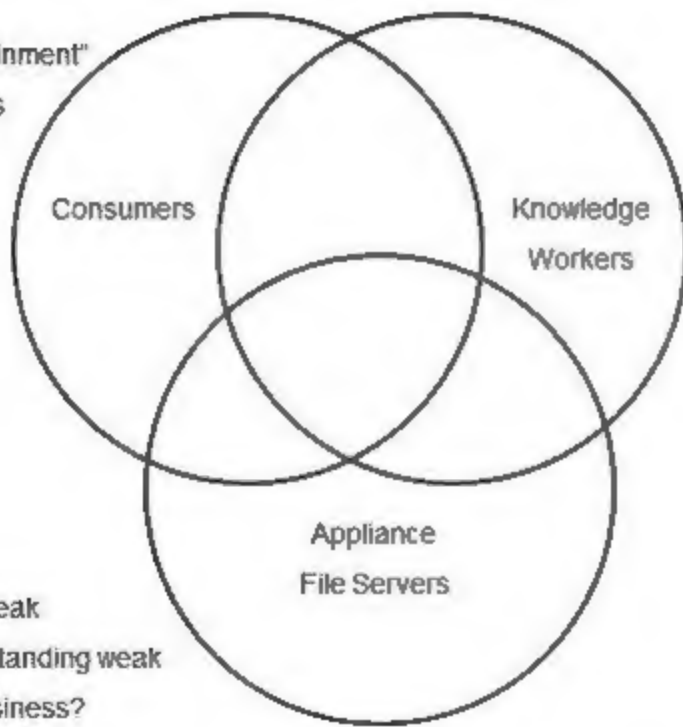


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Three Constituencies



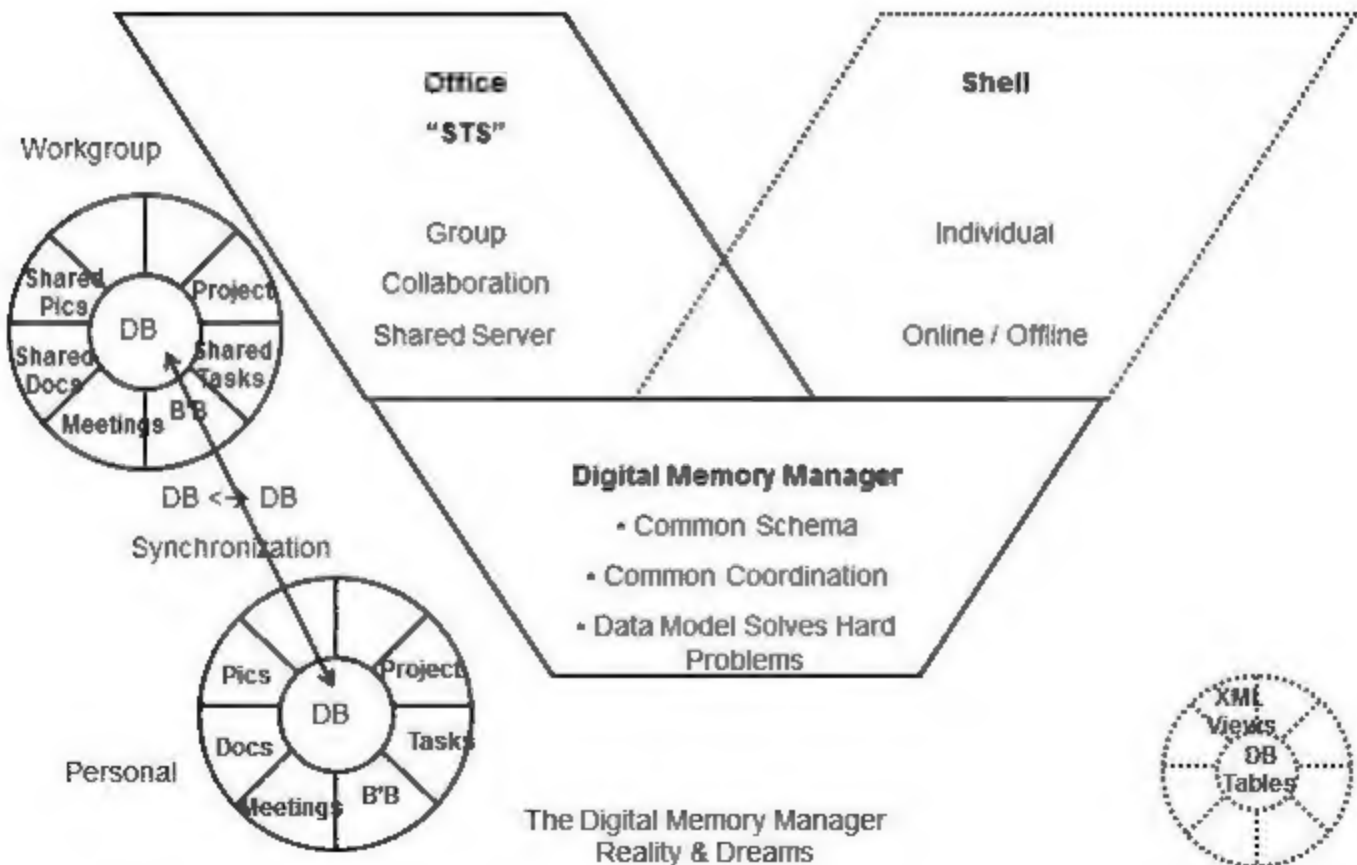
- Shell Users
- Redefine "Entertainment"
- Pictures & Sounds

- Office Users
- Collaboration
 - Shared Workspace in '03
 - Deep Collaboration in '05
- BI – Does Store Play a Role?
- New Datatypes: Does Office play?

- O/S Users
- Strategy still weak
- Market understanding weak
 - Small Business?
 - Hosted or Local?

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Extending Collaboration Offline



The Shell Becomes “Visible”

